

Abstract Submitted
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Coherent structures over Super Hydrophobic and Liquid Infused Surfaces¹ ISNARDO ARENAS, The University of Texas at Dallas, MATTEO BERNARDINI, Universita' di Roma La Sapienza, STEFANO LEONARDI, The University of Texas at Dallas — Numerical Simulations of two superposed fluids in a turbulent channel have been performed. Both walls of the channel are made of longitudinal riblets with a gas fractions of 0.5 and several pitch values $p^+ = 18, 36, 72, 144$. For Liquid Infused Surfaces, LIS, with a viscosity ratio $m = \mu_1/\mu_2 = 0.4$ (where the subscripts 1 and 2 indicate the fluid in the cavities and the overlying fluid respectively) two cases have been considered varying the Weber number: $We = 0$, implying an interface sustained by the surface tension and $We = 1000$ with the dynamics of the interface between the two fluids modeled with a Level Set Approach. Results are compared to the case mimicking water over air (Super hydrophobic Surface SHS $m = 0.02$) and $We = 0$. A smooth channel with one fluid only at $Re_\tau = 180$ is used as reference and to assess how the LIS and SHS modify coherent structures near the wall.

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